

MICROPOROUS DIFFUSION APPARATUS

CROSS-REFERENCE TO RELATED APPLICATIONS

This application is a continuation-in-part application of U.S. Patent Application Serial No. 29/038,499 entitled Bubblersparge Unit for Ground Water Treatment to William B. Kerfoot filed on May 5, 1995 and U.S. Patent Application Serial No. 08/638,017, entitled Groundwater and Soil Remediation with Microporous Diffusion Methods and Apparatuses, to William B. Kerfoot filed on April 25, 1996, which are incorporated herein by reference.

BACKGROUND OF INVENTION

1. FIELD OF INVENTION (Technical field)

The present invention relates to apparatuses for remediation of dissolved chlorinated hydrocarbons in aquifer regions by injecting micro-fine bubbles effective for active in situ groundwater remediation for removal of dissolved chlorinated hydrocarbon solvents and dissolved hydrocarbon petroleum products. Remediation of saturated soils may also be obtained by employment of the present invention.

2. BACKGROUND PRIOR ART

There is a well recognized need to cleanup of subsurface leachate plumes in aquifer regions and contaminated sites including in particular, dry-cleaning establishments and U.S. Military Air bases. Applicant is aware of prior art devices that have used injection of air to facilitate biodegradation of plumes.

However there has not been shown apparatus for remediating a site in a controlled manner of poorly biodegradable organics, particularly dissolved chlorinated solvents with micro-fine bubbles including a multi-gas oxidizing agent.

In fact the Federal Agency (EPA, KERR Environmental Laboratory, ADA, Oklahoma) responsible for review of clean-up procedures at Marine Corp Air Base at Yuma, Arizona has determined that there is no prior references which disclose the use of the present invention and has ordered independent pilot tests to provide test results confirming the results previously obtained by the present invention.

In US Patent No. 5,221,159, to Billings shows injection of air into aquifer regions to encourage biodegradation of leachate plumes which contain biodegradable organics together with simultaneous soil vacuum extraction.

In US Patent No. 5,269,943, METHOD FOR TREATMENT OF SOILS CONTAMINATED WITH ORGANIC POLLUTANTS, to Wickramanayake shows a method for treating soil contaminated by organic compounds wherein an ozone containing gas is treated with acid to increase the stability of the ozone in the soil environment and the treated ozone applied to the contaminated soil to decompose the organic compounds.

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